How Will Synthetic Biology Change the Way We Live?

J. Craig Venter and Michael M. Crow
Zócalo Public Square, September 23, 2014
What is life?
“How can the events in space and time which take place within the spatial boundary of a living organism be accounted for by physics and chemistry?... The obvious inability of present-day physics and chemistry to account for such events is no reason at all for doubting that they can be accounted for by those sciences.”

Erwin Schrödinger
Austrian Physicist (1887-1961)
Nobel Prize, Physics (1933)
What is Life (1944)
Did we answer Schrödinger in 2010? Are we moving forward from a unique human position now that digital biology is possible?
Is life DNA-driven biological machines?
Closing the gap between Natural Science and Design Science.

“Natural Science” — “What we know/understand”

“Design Science” — “What we do with what we know”

Herbert Simon
American political scientist, economist, sociologist (1916-2001)
Sciences of the Artificial (1969)
Nobel Prize, Economics (1978)
How does science fiction foreshadow the future?

Think *Arrowsmith*.
The Panthéon
“I think, therefore I am.”

René Descartes
French philosopher, mathematician, physicist and writer (1596-1650)
Principles of Philosophy (1644)
Pasteur’s Quadrant

Donald Stokes
*Pasteur’s Quadrant* (1997)
Photosystem I

Petra Fromme
ASU Bioenergy Lab
An estimated 3.1% of your DNA is from Neanderthals

Michael Crow: 3.1% or 96th percentile

Average 23andMe user: 2.7%
Synthetic Life

Synthetic *M. mycoides* bacteria

J. Craig Venter Institute (2010)
“What I cannot create, I do not understand.”

Richard Feynman
American Physicist (1918-1988)
Nobel Prize, Physics (1965)
First Law of Robotics

“A robot may not injure a human being or, through inaction, allow a human being to come to harm.”

Isaac Asimov
American Author and Professor (1919-1992)
Runaround (1942)
Thank You